Learning Traditional Denok Dance With Kinect Game

Dominikus Reynard Darmawan, Erdhi Widyarto Nugroho, Ridwan Sanjaya
Department of Information System, Faculty of Computer Science,
Soegijapranata Catholic University, Semarang, Indonesia
dominikusreynard@gmail.com, erdhi@unika.ac.id, ridwan@unika.ac.id

Abstract— Nowadays, culture exchange is so much easier, with the foreign culture walk in to Indonesia, our traditional culture start to be forgotten, one of them is our traditional dance. And also, studying our native culture is considered something outdated. That why its needed a new media to make our traditional culture more modern so not become forgotten. One of the media which can be used is a game and a technology called kinect, with both of it, can be made a simulation game of our traditional dance, so it can be a media for introducing our traditional dance or help to train the dancer.
Keyword— Indonesian traditional dance, kinect, dance, simulation, education game

I. INTRODUCTION

Influence of foreign culture into Indonesia for now is so much easier with the help of Internet, even witohut internet migration of culture still can be happend. For a few years back, the culture of South Korea is spread across the world, especially in film, fashion, music and dance[1]. With the foreign culture walk in into Indonesia, it cause our own culture start to be forgotten[1]. From research at SMP negeri 1 Paloh, student show no interest to art and culture lesson[2], especially about traditional dance its shown from when in teaching process many student like to go to toilet, chatting or sleep in class. No interest from student caused from no variation in teaching, where the teacher only talk about it and focused to teacher only which make the student passive and bored and also student is too shy to try move from the dance[3]. Studying about ourown culture is considered something outdated, thats why its needed a new media so its not outdated.

One of the media which follow current era is a game, right now game can be used for education. Advantages from using game as media for education is visualization and problem more real. MIT (Massachussets Institute of Technology) already prove that game is really usefull for development of logic and problem understanding for player[4]. According to Santoso application for learning culture and art of Indonesian dance in form of photo, moving image, video, and music is more stimulate student interest[5]

And there is a technology called kinect, with this technology, player could interact with computer directly with their body movement[6]. Example of game using kinect is “just dance” and “danz base”, in this game player follow the movement of the model dancer in screen and try to matching the move as much as possible. But in this game only using modern dance. Because of that the writer get the idea for a media to teach about traditional dance.

II. LITERATUR REVIEW

II.1 Traditional Dance

Traditional dance is result of exspression and desire of human for beauty with culture system or background of people who has the culture. Traditional dance is a part from art of dance which already raw because of some rules. Traditional dance is passed from generation to generation thats why its been there a long time ago. Usually traditional dance is have very strong culture trait.

Purpose of traditional dance is for ceremony, entertainment, and show[7].

II.2 Denok Dance

Denok dance is a dance created by Bintang Hanggoro Putra in 1991, according to him, denok dance is inspired style of semarangan dance which is already extinct. Because of that denok dance created for bring up back semarangan dance style and then mixed with move from basic gambang Semarang. With tari denok hopefully it can be pioneer to Semarang unique dance. Denok dance is a solo dance which mean it doesnt required other dancer or there is no move which must be done with other dancer. Denok dance usually done with 4 people because of the song[8].

II.3 Education game

Education game is a media which can be developed. The advantages of education compared to convensional education is visualization and real problem. MIT have prove that game can help develop logic and problem understanding to the player. And also another advantages is education game have animation can help with memory[4].

II.4 Media for Introducing Traditional Dance

There is only little game for introducing traditional dance, one of them is a game "Edugame mengenal tari tradisional Indonesia melalui augmented reality berbasis android".In this game using augmented reality technology, that make this game use camera and can display a 3D model dancer in available marker. In this game also provide a menu to do a test quiz for test player knowledge about traditional dance in Indonesia[9].

For another media except game, there is a education media in shape of application, one of them is an application "Media pembelajaran budaya seni tari Indonesia" create by Arif Santoso. In this application user could see all traditional dance from all around Indonesia, user could also see photos, dance video and also the information. There also a test for testing user knowledge[5]. There is also a few application in play store with concept like encyclopedia.

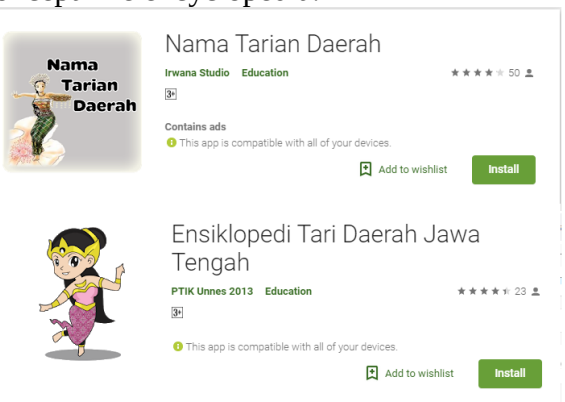

Figure 2.1 education application in playstore

Figure 2.2 content of education application in playstore

II.5 Kinect

Kinect is a technology which make user can interact with computer more natural without using controller, in short user could operate computer with only their body.

Sensor which is used in kinect some of them is RGB camera, depth sensor, and multi array michrophone, these sensor work best in this situation:

- *Horizontal viewing angle:* $57^{0.}$
- *Vertical viewing angle:* $43^{0.}$
- Distance between player and the kinect is 1.2 meter until 4 meter.
- *Depth range*: 400mm (near mode) untill 8000mm (standard mode).

- Temperature from 5^0 untill 35^0 Celcius (41^0 untill 95^0 Farenheit).

The different between kinect and camera is in kinect there is depth sensor, depth sensor is used for taking data from some 3D area without need light of that area.

RGB camera is used for face recognition and other feature detection, with detecting three component which is red, green and blue. RGB camera named by Microsoft because three component its detect. RGB camera almost similar to webcam, which is capturing video with 640x480 resolution with 32 bit color and 30 fps (frame per second). These are standard fps and resolution for kinect:

- Resolusi 640 x 480Fps30 dengan format RGB
- Resolusi 1280x960Fps12 dengan format RGB
- Resolusi 640x480Fps12 dengan format RAW YUV
- Resolusi 640x480Fps15 dengan format YUV

Depth sensor is made from infrared laser projector and monochrome CMOS sensor, which take data from video in shape of 3D without care about the lightning. Infrared in kinect cant be seen with bare eyes and also not dangerous for human body. Infrared send thousand light and bounce back from the object in front of it, these light which then captured by monochrome CMOS sensor, and then calculate time from light which already bounce back from object in front of kinect. This is why kinect could mapping 3D picture in front of it until 1cm depth and 3mm for width and height.

Skeletal tracking is one of kinect feature, this feature could detect every point where human joint located. This Skeletal tracking still using depth sensor[6].

II.6 Simulation Game

Simulation game according to Soetopo(1994) is a method for learning by focusing on learning by doing. In these game player is teach to play a role in real world situation. The purpose of simulation game according to Abimanyu and Purwanto (1990) said, there is 2 purpose, direct purpose and indirect purpose, direct purpose is to train some skill, profesional or daily activity, indirect purpose is give motivation, social activity, and grow creativity[14]. Simulation game also could help to develop decision making skill[15].

When player play dance simulation game, player's cognitive skill is trainer from stimulation of visual and audio, player need to move following the music while keeping body balanced. More and more movement and fast rhytm, then respond time longer and stmulus more complicated, here is where cognitive skill trained.

III. RESEARCH METHODOLOGY

Research done by first observing and literature review for decide the design of the game, after the data collected is completed, next is making the animation of the denok dance with blender 3D, after finish the animation, its reviewed by a traditional dance teacher from Semarang state university, her name is Alvida Nur Vida, after reviewd and stated correct, next step is making the gameplay and in game asset, using free application which is Inkscape and Unity, after that the game is reviewed, tested for get rid of bug. Last after the prototype is completed its ready to be use. The game named "Menari".

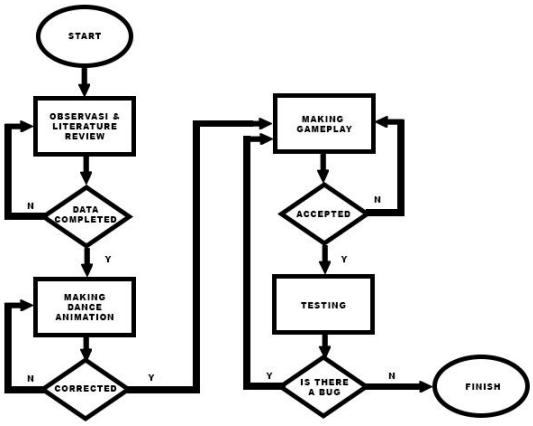

Figure 3.1 Flow of making the game

Next the protoytpe is tested to student to see the result of the game. The object of this research is middle school and grouped into 2 group, first group is from public school and other from private school, number of the audience from private school is 31 and from public school is 21. The method of this

research is using questionnaire, literature review and observation. Primary data is collected from questionnare and interview with traditional dance teacher, and secondary data collected from literature review.

IV. RESULTS AND DISCUSSION

IV.1 profile of respondent

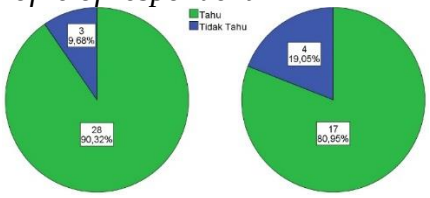

FIgure 4.3 Knowing there is a game with motion sensor

Many student from middle school already knowing there is a game with motion sensor, from private school group from 31 student, only 3 say they dont know, and from public school group not very big difference, only 4 of 17 student which dont know. This mean game with motion sensor is already common knowledge, even in middle school student. Knowing in this question is mean for student already know the game with motion sensor even though never see or play it directly.

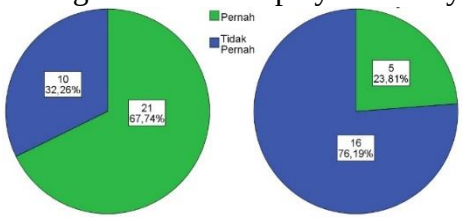

Figure 4.4 Experience of playing a game with motion sensor

From private school group shown many student have more experience playing with kinect than public school group. Its shown from private school group 67,74% student already have experience, but from public school only 23,81% who already have experience.

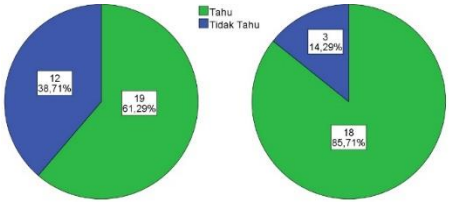

Figure 4.7 Knowing dance of Semarang

From the data shown, knowledge of Semarang traditional dance is much more common in public school group, from public school group only 14,29% who dont know, but from private school group student who have no idea is more than 50% which is 61,29%.

IV.2 Game

Result of the prototype game is a game called “Menari”. In this game player must follow the movement of the model in the game, player need to match as much as possible every movement from the model to get high score and ranking. Dance used in in this game is Denok dance. This game played by one player.

Figure 4.1 game “Menari”

Figure 4.2 Testing game “Menari” 1

Figure 4.3 Testing game “Menari” 2

The reward system in this game is score and ranking, ranking available is S, A, B, C, D and E, score seperated to 2 type, a “Luar Biasa” score is 50 point for every hit, and a

"Bagus" score is 30 point for every hit. For get a S rank player must score above 10.000 point, for A rank player must score above 8.000, for B rank player must score above 7.000, for C rank player must score above 3.500, for D rank player must score above 2.500 and last for E rank is placed if player get score below 2.500. Maximum score which available for player to get is 14.300.

Figure 4.4 Reward screen in game

Highscore will be shown in main menu below dance button.

Picture 4.5 Highscore in mainmenu

For punishment system used in this game is a game over system if player missed to many move from the dancer model, there is miss bar on bottom of the screen, if the player miss a move, the bar will start to fill.

Figure 4.6 Miss bar

To reduce the miss bar, player must continue the move and get a match for a score. If the bar full then the game is over, game will move to game over screen and after that player back to main menu and player can play again the dance from beginning.

Figure 4.6 Game over screen

IV.3 Review of the game

	Interest	Visual	Music	Gameplay	Easy	Menu	Scoring	Finishing
A	3.0	3.13	3.0	3.42	3.32	3.06	3.48	3.32
B	3.43	3.38	3.43	3.48	3.48	3.48	3.81	3.19

Table 4.1 Review of the game

A = Private School Group

B = Public School Group

Above is a the review from the respondent from both group. Scale used is 1 to 5. From data its show game "Menari" get enough positve review, espesially from public school group.

IV.4 Impact of the game

	Know dance	Know Music	Proud	Help
Private	3.48	3.48	3.58	3.74
Public	3.29	3.19	3.52	3.52

Table 4.2 Impact to private school group

Above is the impact to both group, Scale used is 1 to 5, From data show game "Menari" have enough impact to introduce dance, music, grow proud feeling and helping. The impact feel higher to private school group.

V. CONCLUSION

The conclusions from this research is game "Menari" could raises student interest and proud to traditional dance, with inside this game showing the beauty of the dance and music, and with this game the student could also feel how the movement, after knowing about it, student start to like it, with like the

proud feeling also starting to grow from student because student think our traditional dance is pretty amazing. Game "Menari" could also help student following and remembering the movement, because that is the main element of this game, the gameplay is student need to follow the movement to finish the game, with playing over-and over again, student get used to the movement of the dance. The reward and punishment system in game "Menari" is enough to make student to playing and finishing the game.

REFERENCES

[1] F. K. Simbar, "Fenomena konsumsi budaya korea Pada Anak Muda Di Kota Manado," J. Holistik, no. 18, pp. 1–20, 2016.

[2] Hermansyah, I. Fretisari, and A. Muniir, "Upaya Meningkatkan Minat Belajar Siswa Pada Materi Seni Tari Jepin Lembut Melalui Metode Kooperatif Jigsaw Di Smp," J. Pendidik. dan Pembelajaran, vol. 6, no. 4, pp. 1–15, 2016.

[3] Y. MARSELA, "Implementasi Animasi Tarian Daerah Dengan Menggunakan Iclone (Studi Kasus : Tari Gambyong)," Universitas Muhammadiyah Surakarta, 2016.

[4] A. V. Vitianingsih, "Game Edukasi Sebagai Media Pembelajaran Pendidikan Anak Usia Dini," Inform, vol. 1, no. 1, pp. 1–8, 2016.

[5] A. Santoso, "Perancangan Media Pembelajaran Budaya Seni Tari Indonesia Berbasis Multimedia Pada Sekolah Dasar Muhammadiyah Ambarbinangun," Stmik Amikom Yogyakarta, 2014.

[6] Hartono, Liliana, and R. Intan, "Pendeteksian Gerak Menggunakan Sensor Kinect for Windows," J. Infra, vol. 3, no. 2, p. pp-375, 2015.

[7] J. Lail and R. Widad, "Belajar tari tradisional dalam upaya meletarikan tarian asli indonesia," J. Inov. dan Kewirausahaan, vol. 4, no. 2, pp. 2014–2016, 2015.

[8] S. Desytha, "Proses Penciptaan Tari Denok Karya Bintang Hanggoro Putra," INSTITUT SENI INDONESIA YOGYAKARTA, 2017.

[9] N. USTIA, "Edugame Mengenal Tari Tradisional Indonesia Melalui Augmented Reality Berbasis Android," Universitas Muhammadiyah Surakarta, 2016.

[10] K. M. Mulyono and H. Al Fatta, "Pembuatan Game Labirin Dengan Menggunakan Blender 3d," J. Dasi, vol. 13, no. 2, p. 4, 2012.

[11] Sokibi, Modul Latihan Desain Grafis Inkscape. Pelatihan dan Migrasi Pabrik Sepatu FANS, 2014.

[12] M. F. Shiratuddin and W. Thabet, "UTILIZING A 3D GAME ENGINE TO DEVELOP A VIRTUAL DESIGN REVIEW SYSTEM," J. Inf. Technol. Constr., vol. 16, no. 39, pp. 1–30, 2011.

[13] A. C. Hanggoro, R. Kridalukmana, and K. T. Martono, "Pembuatan Aplikasi Permainan ' Jakarta Bersih ' Berbasis Unity," J. Teknol. dan Sist. Komput., vol. 3, no. 4, pp. 503–511, 2015.

[14] A. Hadis, "Permainan Simulasi Sebagai Teknik Bimbingan Sosial bagi Siswa Sekolah Luar Biasa," J. Ilmu Pendidik., vol. 7, no. 4, p. 8, 2000.

[15] MUHTAR, "Pengaruh teknik permainan simulasi terhadap pengambilan keputusan studi lanjut pada peserta didik di smp negeri 1 kendal kabupaten ngawi," UNIVERSITAS MUHAMMADIYAH SURAKARTA, 2013.

[16] S. Fauzianisa, T. A. Sumekar, and A. P. Wati, "PENGARUH BERMAIN VIDEO GAME KINETIK SIMULASI TARI SEBAGAI EXERGAME TERHADAP KELINCAHAN," J. Kedokt. diponegoro, vol. 5, no. 4, pp. 1724–1735, 2016.